



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

MICHAEL F. EASLEY
GOVERNOR

LYNDO TIPPETT
SECRETARY

October 25, 2004

Addendum No. 3

RE: Contract ID: C201320
WBS # 112.104401
F.A. # ER-NC05(2)
Haywood County
I-40 Slide Repair between Mile Marker 3 & 4

October 26, 2004 Step 2 Proposal

To Whom It May Concern:

Reference is made to the proposal form furnished to you on the above-mentioned project.

The following revisions have been made to the Project Special Provision for "Temporary Soil Nail Walls":

On Page No. 70h, the last sentence under "paragraph no. 7" has been revised to change "30 days" to "90 days".

On Page No. 70m, in the last sentence under the paragraph titled "Wall Discontinuities", the words "at least 30 days" have been removed.

On Page No. 70r, in the first sentence under the section titled "Field Quality Control", the words "Both preconstruction and" have been removed.

On Page No. 70s, all references to "Preconstruction Test Panels" have been deleted.

On Page No. 70w, the first sentence of the first paragraph under "Verification Testing" has been revised to replace the words "prior to procuring materials for or installation of production nails" with the words "on one of the first five nails".

The changes on the above mentioned pages have been highlighted (shaded background).
The contract will be prepared to include the above mentioned changes.

Sincerely,

A handwritten signature in black ink, appearing to read 'R.A. Garriss', with a long horizontal flourish extending to the right.

R.A. Garriss, P.E.
Contract Officer

RAG/nss
Attachments

Cc: Mr. W.S. Varnedoe, P.E.
Mr. S.D. DeWitt, P.E.
Mr. E.C. Powell, P.E.
Mr. J.B. Setzer, P.E.
Ms. D.M. Barbour, P.E.
Mr. Art McMillian, P.E.
Mr. J.V. Barbour, P.E.
Mr. Mark Staley (2)
Mr. Aydren Flowers
Mr. R.E. Davenport, P.E.
Ms. Kim Canady
Ms. Taylor Mishoe
Project File (2)

Nozzlemen. Evidence that the proposed nozzelman have been certified to the requirements of ACI 506.3R within the last five years is required.

Construction Submittals

Provide the following submittals for the Engineer's review and approval. Changes or deviations from the approved submittals must be re-submitted for approval by the Engineer. The Contractor will not be allowed to begin wall construction until all submittal requirements are satisfied and found acceptable to the Engineer. No adjustments in contract time will be allowed due to incomplete submittals. Items listed below that have been included on the contractor prepared plans need not be resubmitted.

At least 5 days prior to initiating the work, submit to the Engineer:

1. Proposed schedule and detailed construction sequences.
2. Methods of excavation to the staged lifts indicated in the plans and excavation equipment types.
3. Drilling methods and equipment.
4. Nail grout mix design including:
 - Brand and type of Portland cement.
 - Source, gradation and quality of all aggregates.
 - Proportions of mix by weight.
 - Compressive strength test results (per AASHTO T106) verifying the required minimum seven day grout compressive strengths or previous test results completed within one year of the start of the work may be submitted for verification of the required compressive strength.
5. Nail grout placement procedures and equipment.
6. Soil nail testing methods and equipment including:
 - Details of the jacking frame and appurtenant bracing.
 - Details showing methods of isolating test nails during shotcrete application (i.e., methods to prevent bonding of the soil nail bar and the shotcrete).
 - Details showing methods of grouting the unbounded length of test nails after completion of testing.
 - Equipment list.
7. Identification number and certified calibration records for each load cell, test jack pressure gauge and jack master pressure gauge to be used. Calibration records must include the date tested, device identification number and the calibration test results and be certified for an accuracy of at least two percent of the applied certification loads by a qualified independent testing laboratory within 90 days prior to submittal.

demonstrate for each material type at his own expense that the unsupported final excavation face will be stable over the proposed extension of the exposure period. Extensions to the face exposure period will be periodically reviewed and may be revoked by the Engineer at his discretion. Risk of damage to existing structures or structures included in this work will be borne by the Contractor where approval for extended face exposure period is granted by the Engineer. Where extension of the face exposure period is allowed, provide and install polyethylene sheets (properly anchored to the top and bottom of the excavation) to reduce degradation of the cut face caused by changes in soil moisture, unless otherwise approved by the Engineer.

Wall Discontinuities

Where the Contractor's excavation and installation methods result in a discontinuous wall along any continuous nail row, the ends of the wall at the points of discontinuity must be constructed to prevent sloughing or failure of the temporary slopes. Submit a plan for wall discontinuity construction sequencing and shoring to the Engineer for review and approval prior to starting work on the affected wall sections.

Protrusions and Voids

Remove all cobbles, boulders, rubble or debris which are encountered at the soil face during excavation and which protrude from the soil face more than 2 inches (50 mm) into the design shotcrete thickness shown on the plans. Backfill any overexcavations with shotcrete. Any shotcrete used to fill voids created by the removal of cobbles and boulders or other obstructions will be considered incidental to the shotcrete wall facing and no additional payment will be made. Generally, rocky ground such as colluvium, hard rock, fill with boulders and weathered rock will be difficult to excavate on a neat line without leaving pockets and voids. The Contractor is recommended to evaluate the subsurface conditions in order to anticipate the total volume of shotcrete needed.

Excavation Face Instability

Raveling or local instability of the final wall face excavation due to the presence of groundwater, problematic soil conditions, equipment vibrations or other causes must be brought to the immediate attention of the Engineer.

Temporarily stabilize unstable areas by means of buttressing the exposed face with an earth berm or other methods acceptable to the Engineer. Suspend work in unstable areas until remedial measures submitted by the Contractor and approved by the Engineer have successfully stopped facial instability.

Timber backing or lagging behind soil nail walls that is to remain in place and if greater than 1 inch (25 mm) total thickness must be pressure treated with wood preservative for soil and fresh water use in accordance with AWPB LP-22 to a minimum retention 4 pounds per cubic foot (0.06 kilonewtons per cubic meter). Use one of the following wood preservatives: Creosote, Creosote-Coal tar solution, Penta Chlorophenol, Copper Naphthenate, ammonia copper arsenate, ammoniacal, copper zinc arsenate, acid copper chromate or chromated copper arsenate

Access

Provide aggregate for shotcrete that meets the strength and durability requirement of AASHTO M-80 and M-43 and the following gradation requirements:

<u>Sieve Size</u>	<u>% Passing by Weight</u>
1/2 inch (13 mm)	100
3/8 inch (10 mm)	90-100
No. 4	70-85
No. 8	50-70
No. 16	35-55
No. 30	20-35
No. 50	8-20
No. 100	2-10

Proportioning

Proportion and deliver shotcrete with a minimum cement content of 658 pounds per cubic yard (390 kilograms per cubic meter). Aggregate cement ratio may not be more than 4.5 by weight and water/cement ratio may not be more than 0.45. For wet-mix shotcrete the air content at delivery to the pump should be in the range of 7 to 10 percent when tested in accordance with ASTM C231.

Strength Requirements

Produce a shotcrete mix capable of attaining 2000 psi (14 MPa) compressive strength in three days and 4000 psi (28 MPa) in 28 days. The average compressive strength of each set of three cores should be equal to or exceed 85 percent with no individual core less than 75 percent of the specified compressive strength.

Mixing and Batching

Aggregate and cement may be batched by weight or by volume in accordance with the requirements of ASTM C91 and ASTM C685, respectively. Provide mixing equipment that is capable of thoroughly mixing the materials in sufficient quantity to maintain continuity during placement. Ready mix shotcrete must comply with AASHTO M-157. Batch, deliver and place ready mix shotcrete within 90 minutes of mixing.

Field Quality Control

Production shotcrete test panels are required. Do not disturb test panels within the first 24 hours. Field cure the test panels under conditions similar to those anticipated for the work.

Perform field control tests in the presence of the Engineer. Provide equipment, materials and the services of one or more employees as necessary to obtain shotcrete cores for testing including construction of test panel boxes, field curing requirements and coring. The Department will perform compressive strength testing in accordance with ACI 506R. The frequency specified for test panels is approximate. The Engineer may require a greater or lesser number of panels.

Production test panels must be 18 x 18 inches (450 x 450 mm) and a minimum of 4 inches (100 mm) thick.

Test reports that indicate unsatisfactory compressive shotcrete properties will result in suspension of the crew responsible for the unsatisfactory specimens until they have demonstrated that they are capable of producing acceptable work or until additional specimens have been submitted, tested and proven satisfactory. Cost associated with field quality control testing including additional testing and lost production due to tests failing to meet the specifications will be borne by the Contractor.

Production Test Panels

Furnish at least one production test panel or, in lieu of production test panels, six 3 inch (75 mm) diameter cores from the shotcrete face for every 5000 square feet (460 square meters) or 50 cubic yards (38 cubic meters) of shotcrete placed, whichever is less. Construct the production test panels simultaneously with the shotcrete facing installation at times designated by the Engineer.

Core Testing

Cut at least six core samples from each production test panel at the frequency specified herein. Soak cores in water for at least 40 hours in accordance with AASHTO T24. Cores should be at least 3 inches (75 mm) in diameter and have a minimum length to diameter ratio of one. When the length of a core is less than twice the diameter, apply correction factors given in ASTM

Testing Equipment

Two dial or vernier gauges, a dial gauge support, jack and pressure gauge, master pressure gauge and a reaction frame are required for testing.

Use a minimum of two dial or vernier gauges capable of measuring to 0.001 inch (.025 mm) to measure the nail movement. The dial gauges should have a minimum stroke of 3 inches (75 mm). Align the dial gauges within five degrees from the axis of the nail and support the dial gauges independently of the jacking set-up and the wall. Apply the test load with a hydraulic jack and a pump.

The jack and pressure gauge must be calibrated by an independent testing laboratory as a unit. Provide a pressure gauge that is graduated in 1000 psi (700 KPa) increments or less and has a range not exceeding twice the anticipated maximum pressure during testing unless otherwise approved by the Engineer. Use the pressure gauge to measure the applied load. The minimum ram travel of the jack may not be less than 4 inches (100 mm). The jack should be capable of applying each load in less than one minute.

Independently support and center the jack over the nail so that the nail does not carry the weight of the jack. Calibrate the master pressure gauge with the test jack and pressure gauge as a unit. Monitor the loads on the nails during the verification tests with both the master pressure gauge and electric load cell. The load cell will be used to maintain constant load hold throughout the creep test. Provide recent calibration curves. Place the stressing equipment over the nail in such a manner that the jack, bearing plates, load cell and stressing anchorage are in alignment. Position the jack at the beginning of the test such that unloading and repositioning of the jack during the test is not required.

Provide a reaction frame that is sufficiently rigid and of adequate dimension such that excessive deformation of the test apparatus requiring repositioning of any components does not occur. Where the reaction frame bears directly on the shotcrete, the reaction frame must be designed to prevent fracture of the shotcrete. No part of the reaction frame may bear within 6 inches (150 mm) of the edge of the test nail breakout unless otherwise approved by the Engineer.

Verification Testing

Perform verification testing horizontally on one of the first five nails to verify the Contractor's installation methods, soil conditions, nail capacity and design assumptions. Verification tests must be performed within the limits of the work area. **A minimum of two verification tests or one verification test for each set of assumed soil parameters**, whichever is greater, are required at locations approved by the Engineer. Additional verification tests are required where ground conditions differ from those anticipated or as shown in the approved submittals.

Submit details of the verification testing arrangement including the method of distributing test load pressures to the excavation surface (reaction frame), test nail bar size and grade, grouted hole diameter and reaction plate dimensioning to the Engineer